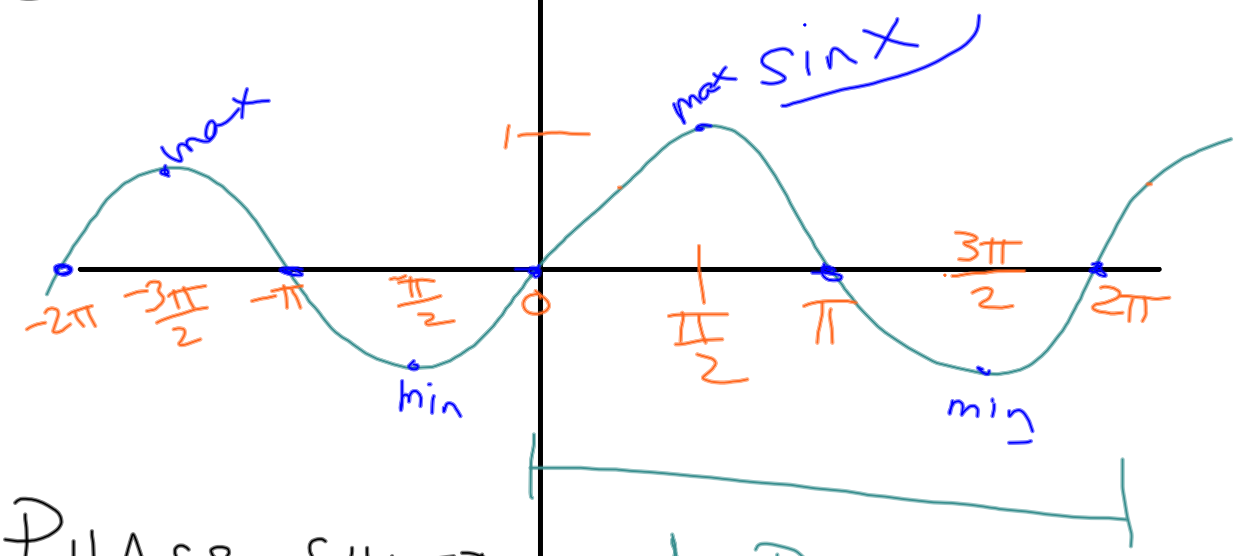
7.1

AMPLITUDE $= \frac{1}{2}$ RANGE



PHASE SHIFT

secret code word for horizontal shift

1 PERIOD

FREQUENCY

= how many periods in 2π

$$3\sin\left(2x+\frac{\pi}{2}\right)-1$$

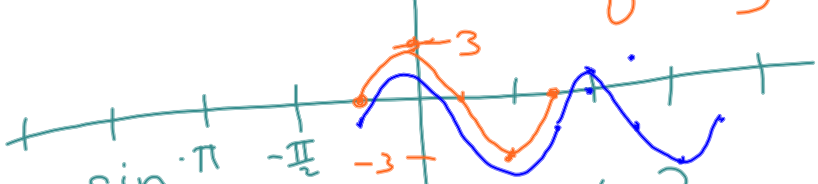
amplitude

$2\left(x+\frac{\pi}{4}\right)$

vert shift

frequency

hor shift



Period $= \frac{2\pi}{2} = \pi$

$0 = 2x+\frac{\pi}{2}$

$2\pi = 2x+\frac{\pi}{2}$

$2x+\frac{\pi}{2}=0$

$2x = -\frac{\pi}{2}$

$x = -\frac{\pi}{4}$

$2x+\frac{\pi}{2}=2\pi$

$2x = 2\pi-\frac{\pi}{2}=\frac{3\pi}{2}$

$x=\frac{3\pi}{4}$

Period $= \frac{3\pi}{4}-\left(-\frac{\pi}{4}\right) = \frac{3\pi}{4}+\frac{\pi}{4} = \frac{4\pi}{4} = \pi$

Division Algorithm Theorem

$$P(x) = Q(x)\,D(x) + R(x)$$

$$P(x) = Q(x)(x-c) + R(x)$$

$$P(c) = Q(c)(c-c) + R(c)$$

4.1
33) $f(x) = 3x^4 - 6x^3 + 2x - 1$

Find remainder when $f(x)$ is divided by $x+1$

but don't use division.

$f(x) = Q(x) \cdot \underbrace{(x+1)}_{\text{divisor}} + R(x)$

degree of $R(x)$ LESS THAN degree(divisor)

select $x = -1$

$f(-1) = R(-1)$

$f(-1) = 3(-1)^4 - 6(-1)^3 + 2(-1) - 1$

$= +3 + 6 - 2 - 1 = 6$

$$
\begin{array}{r}
3x^3 - 9x^2 + 9x - 7 \\
x+1 \overline{\big) 3x^4 - 6x^3 + 0x^2 + 2x - 1} \\
-(3x^4 + 3x^3) \\
\hline
-9x^3 + 0x^2 + 2x - 1 \\
-(-9x^3 - 9x^2) \\
\hline
9x^2 + 2x - 1 \\
-(9x^2 + 9x) \\
\hline
-7x - 1 \\
-(-7x - 7) \\
\hline
+6
\end{array}
$$

4.1/21)

$5x^4+5x^2+5$ divide by x^2-x+1

$$
\begin{array}{r|l}
 & 5x^2+5x+5 \\
x^2-x+1 & 5x^4+0x^3+5x^2+0x+5 \\
 & -(5x^4-5x^3+5x^2) \\
 & 5x^3+0x^2+0x+5 \\
 & -(5x^3-5x^2+5x) \\
 & 5x^2-5x+5 \\
 & -(5x^2-5x+5) \\
 & 0
\end{array}
$$

$\frac{5x^4}{x^2}=5(x^{4-2})$

$=5x^2$

$5x^4+5x^2+5=(x^2-x+1)(5x^2+5x+5)+0$

$x^2-x+1=0$

QF: $x=\frac{+1\pm\sqrt{1-4(1)(1)}}{2}$

$x+1=0$

root: $x=-1$

$$-1 \,|\, 3 \;\; -6 \;\; 0 \;\; 2 \;\; -1$$